Docket No. RSW920010058US1

METHOD AND SYSTEM FOR AUTOMATED COLLABORATION USING ELECTRONIC BOOK HIGHLIGHTS AND NOTATIONS

1. Field of the Invention:

The present invention relates generally to an improved data processing system. Still more particularly, the present invention relates to the sharing of highlighted passages and notations in an electronic book.

2. Background of the Invention:

The Internet, also referred to as an "internetwork", is a set of computer networks, possibly dissimilar, joined together by means of gateways that handle data transfer and the conversion of messages from protocols of the sending network to the protocols used by the receiving network (with packets if necessary). When capitalized, the term "Internet" refers to the collection of networks and gateways that use the TCP/IP suite of protocols.

The Internet has become a cultural fixture as a source of both information and entertainment. Many businesses are creating Internet sites as an integral part of their marketing efforts, informing consumers of the products or services offered by the business or providing other information seeking to engender brand loyalty. Many federal, state, and local government agencies are also employing Internet sites for informational purposes, particularly agencies, which must interact with virtually all segments of society such as the Internal Revenue

Service and secretaries of state. Providing informational guides and/or searchable databases of online public records may reduce operating costs. Further, the Internet is becoming increasingly popular as a medium for commercial transactions.

Currently, the most commonly employed method of transferring data over the Internet is to employ the World Wide Web environment, also called simply "the Web". Other Internet resources exist for transferring information, such as File Transfer Protocol (FTP) and Gopher, but have not achieved the popularity of the Web. In the Web environment, servers and clients effect data transaction using the Hypertext Transfer Protocol (HTTP), a known protocol for handling the transfer of various data files (e.g., text, still graphic images, audio, motion video, etc.). The information in various data files is formatted for presentation to a user by a standard page description language, the Hypertext Markup Language (HTML). In addition to basic presentation formatting, HTML allows developers to specify "links" to other Web resources identified by a Uniform Resource Locator (URL). A URL is a special syntax identifier defining a communications path to specific information. Each logical block of information accessible to a client, called a "page" or a "Web page", is identified by a URL. The URL provides a universal, consistent method for finding and accessing this information, not necessarily for the user, but mostly for the user's Web "browser". A browser is a program capable of submitting a request for information identified by an identifier, such as, for example, a URL. A user may enter a domain name through a graphical user interface (GUI) for

the browser to access a source of content. The domain name is automatically converted to the Internet Protocol (IP) address by a domain name system (DNS), which is a service that translates the symbolic name entered by the user into an IP address by looking up the domain name in a database.

The Internet also is widely used to transfer applications to users using browsers. With respect to commerce on the Web, individual consumers and business use the Web to purchase various goods and services. In offering goods and services, some companies offer goods and services solely on the Web while others use the Web to extend their reach. Many sources of information are available on the Web, including electronic books and journals. The demand and need to gather information quickly is increasing as technology advances.

When using an electronic book, referred to as an "e-book", a user has the ability to highlight and notate text for further reference. Various methods exist providing users the facility of tagging specific passages of e-book text. These methods include allowing the user to highlight passages of text and notate partial or complete sections of text. The ability to share this information is desired. E-books may contain large amounts of text. Multiple people may view the same e-book. When others want to discuss various areas of the e-book, referring back to highlighted text is desired, but may be cumbersome and time consuming due to the size of the electronic book. Therefore, it would be advantageous to have an improved method, apparatus, and computer instructions to share information gathered from the electronic book.

SUMMARY OF THE INVENTION

The present invention provides a method, apparatus, and computer implemented instructions for sharing highlighted passages and notations in an electronic book. A user can highlight passages and/or notes, which are tagged and automatically sent to a designated set of recipients. The designated recipients can enter search criteria so that the highlighted passages and/or notes are displayed in their electronic book based on the specified criteria.

BRIEF DESCRIPTION OF THE DRAWINGS

The novel features believed characteristic of the invention are set forth in the appended claims. The invention itself, however, as well as a preferred mode of use, further objectives and advantages thereof, will best be understood by reference to the following detailed description of an illustrative embodiment when read in conjunction with the accompanying drawings, wherein:

Figure 1 depicts a pictorial representation of a network of data processing systems in which the present invention may be implemented;

Figure 2 is a block diagram of a data processing system that may be implemented as a server in which the present invention may be implemented;

Figure 3 is a block diagram illustrating a data processing system in which the present invention may be implemented;

Figure 4 is a block diagram of a collaboration process for electronic books in accordance with a preferred embodiment of the present invention;

Figure 5 is a diagram of an electronic book with a pop-up menu displayed in accordance with a preferred embodiment of the present invention;

Figure 6 is a diagram of an electronic book with a pop-up window to add a note in accordance with a preferred embodiment of the present invention;

Figure 7 is a diagram of an electronic book with a pop-up window to sort notes in accordance with a preferred embodiment of the present invention;

Figure 8 is a flowchart of the process of selecting recipients and groups of recipients for the highlighted passages and/or notes in accordance with a preferred embodiment of the present invention;

Figure 9 is a flowchart of the process of maintaining notes for collaboration in accordance with a preferred embodiment of the present invention;

Figure 10 is a flowchart of the process of maintaining highlighted passages for collaboration in accordance with a preferred embodiment of the present invention;

Figure 11 is a flowchart of the process of sending highlighted passages and/or notes to a set of recipients in accordance with a preferred embodiment of the present invention;

Figure 12 is a flowchart of the process of receiving highlighted passages and/or notes from other users in accordance with a preferred embodiment of the present invention; and

Figure 13 is a flowchart of the process of displaying highlighted passages and/or notes in accordance with a preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference now to the figures, **Figure 1** depicts a pictorial representation of a network of data processing systems in which the present invention may be implemented. Network data processing system **100** is a network of computers in which the present invention may be implemented. Network data processing system **100** contains a network **102**, which is the medium used to provide communications links between various devices and computers connected together within network data processing system **100**. Network **102** may include connections, such as wire, wireless communication links, or fiber optic cables.

In the depicted example, server **104** is connected to network **102** along with storage unit **106**. In addition, clients **108**, **110**, and **112** are connected to network **102**. These clients **108**, **110**, and **112** may be, for example, personal computers or network computers. In the depicted example, server **104** provides data, such as boot files, operating system images, and applications to clients **108-112**. Clients **108**, **110**, and **112** are clients to server **104**. Network data processing system **100** may include additional servers, clients, and other devices not shown. In the depicted example, network data processing system **100** is the Internet with network **102** representing a worldwide collection of networks and gateways that use the TCP/IP suite of protocols to communicate with one another. At the heart of the Internet is a backbone of high-speed data communication lines between major nodes or host computers, consisting of thousands of commercial, government, educational and other computer systems that route data and

messages. Of course, network data processing system **100** also may be implemented as a number of different types of networks, such as for example, an intranet, a local area network (LAN), or a wide area network (WAN). **Figure 1** is intended as an example, and not as an architectural limitation for the present invention.

Referring to **Figure 2**, a block diagram of a data processing system that may be implemented as a server, such as server **104** in **Figure 1**, is depicted in accordance with a preferred embodiment of the present invention. Data processing system **200** may be a symmetric multiprocessor (SMP) system including a plurality of processors **202** and **204** connected to system bus **206**. Alternatively, a single processor system may be employed. Also connected to system bus **206** is memory controller/cache **208**, which provides an interface to local memory **209**. I/O bus bridge **210** is connected to system bus **206** and provides an interface to I/O bus **212**. Memory controller/cache **208** and I/O bus bridge **210** may be integrated as depicted.

Peripheral component interconnect (PCI) bus bridge **214** connected to I/O bus **212** provides an interface to PCI local bus **216**. A number of modems may be connected to PCI local bus **216**. Typical PCI bus implementations will support four PCI expansion slots or add-in connectors. Communications links to network computers **108-112** in **Figure 1** may be provided through modem **218** and network adapter **220** connected to PCI local bus **216** through add-in boards.

Additional PCI bus bridges **222** and **224** provide interfaces for additional PCI local buses **226** and **228**,

from which additional modems or network adapters may be supported. In this manner, data processing system **200** allows connections to multiple network computers. A memory-mapped graphics adapter **230** and hard disk **232** may also be connected to I/O bus **212** as depicted, either directly or indirectly.

Those of ordinary skill in the art will appreciate that the hardware depicted in **Figure 2** may vary. For example, other peripheral devices, such as optical disk drives and the like, also may be used in addition to or in place of the hardware depicted. The depicted example is not meant to imply architectural limitations with respect to the present invention.

The data processing system depicted in **Figure 2** may be, for example, an IBM e-Server pSeries system, a product of International Business Machines Corporation in Armonk, New York, running the Advanced Interactive Executive (AIX) operating system or LINUX operating system.

With reference now to **Figure 3**, a block diagram illustrating a data processing system is depicted in which the present invention may be implemented. Data processing system **300** is an example of a client computer. Data processing system **300** employs a peripheral component interconnect (PCI) local bus architecture. Although the depicted example employs a PCI bus, other bus architectures such as Accelerated Graphics Port (AGP) and Industry Standard Architecture (ISA) may be used. Processor **302** and main memory **304** are connected to PCI local bus **306** through PCI bridge **308**. PCI bridge **308** also may include an integrated memory controller and cache memory for processor **302**. Additional connections to PCI

local bus **306** may be made through direct component interconnection or through add-in boards. In the depicted example, local area network (LAN) adapter **310**, SCSI host bus adapter **312**, and expansion bus interface **314** are connected to PCI local bus **306** by direct component connection. In contrast, audio adapter **316**, graphics adapter **318**, and audio/video adapter **319** are connected to PCI local bus **306** by add-in boards inserted into expansion slots. Expansion bus interface **314** provides a connection for a keyboard and mouse adapter **320**, modem **322**, and additional memory **324**. Small computer system interface (SCSI) host bus adapter **312** provides a connection for hard disk drive **326**, tape drive **328**, and CD-ROM drive **330**. Typical PCI local bus implementations will support three or four PCI expansion slots or add-in connectors.

An operating system runs on processor **302** and is used to coordinate and provide control of various components within data processing system **300** in **Figure 3**. The operating system may be a commercially available operating system, such as Windows 2000, which is available from Microsoft Corporation. An object oriented programming system such as Java may run in conjunction with the operating system and provide calls to the operating system from Java programs or applications executing on data processing system **300**. "Java" is a trademark of Sun Microsystems, Inc. Instructions for the operating system, the object-oriented operating system, and applications or programs are located on storage devices, such as hard disk drive **326**, and may be loaded into main memory **304** for execution by processor **302**.

Those of ordinary skill in the art will appreciate that the hardware in **Figure 3** may vary depending on the implementation. Other internal hardware or peripheral devices, such as flash ROM (or equivalent nonvolatile memory) or optical disk drives and the like, may be used in addition to or in place of the hardware depicted in **Figure 3**. Also, the processes of the present invention may be applied to a multiprocessor data processing system.

As another example, data processing system **300** may be a stand-alone system configured to be bootable without relying on some type of network communication interface, whether or not data processing system **300** comprises some type of network communication interface. As a further example, data processing system **300** may be a Personal Digital Assistant (PDA) device, which is configured with ROM and/or flash ROM in order to provide non-volatile memory for storing operating system files and/or user-generated data.

The depicted example in **Figure 3** and above-described examples are not meant to imply architectural limitations. For example, data processing system **300** also may be a notebook computer or hand held computer in addition to taking the form of a PDA. Data processing system **300** also may be a kiosk or a Web appliance.

Turning next to **Figure 4**, a block diagram of a data processing system illustrating a collaboration process for electronic books is depicted in accordance with a preferred embodiment of the present invention. Client **410** may be used to display an e-book **420**. A user can highlight or select passages **424** and **428** within an e-

book, which may be sent to other e-book users. A note, such as note **429** may be associated with a passage, such as passage **428**. This note also will be tagged for transmission to another user in these examples. Alternatively a note may be sent without a highlighted passage. These notes may contain text, such as comments about the passage or may contain other information. For example, a note may contain references that related to the passage. The reference may refer to anything about the text, such as, for example, a book title, author, publisher, publication date, ISBN number, section, chapter, page, paragraph, topic, subject, or category. Other information that may be included in a note are, for example, a user name, the name of the user highlighting the text, career field, interests, and other books being researched.

The primary user, depicted as client **410** in the block diagram, may designate a set of recipients through the use of a collaboration process **430** by selecting other e-book users or groups of e-book users from a user list **440**. The highlighted or selected passages and/or notes can be sent to another e-book user such as client **450**, where the user name for client **450** is included in the user list **440**. Collaboration process **460** highlights, in e-book **470** passages **474** and **478** and note **479**, which correspond to passages **424** and **428** and note **429** from e-book **420**. These passages are transmitted through a communications link that is used to download book content to the e-book. A server, such as server **200** in **Figure 2**, is used to relay the information in a manner similar to email. For example, a server, such as Lotus Domino,

could use email mechanisms to facilitate the collaboration.

Next, **Figure 5** is a diagram of an electronic book with a pop-up menu displayed in accordance with a preferred embodiment of the present invention. Many e-books have menus located on the margins of their screens, such as menu **510**. Menu **510** may have an option add note **520** as shown in e-book **500**. Additionally, menu **510** may allow for sorting of notes using the menu option sort notes **530**.

Figure 6 is a diagram of an electronic book with a pop-up window to add a note in accordance with a preferred embodiment of the present invention. If the option to a add note, such as option add note **520** in **Figure 5**, is selected. Pop-up window **600** to add a note may be displayed in response to a selection of add note **520** in **Figure 5**. Scroll box **610** may be used to enter the text for the note. Check box **620** can be marked to tag the note to be shared with a book club or other group of users. Selection box **630** can allow the user to select a particular book club or other group, which will receive the note and associated passage. The user may choose to click on save button **640** to save the note and tag the note to be shared with the selected book club if box **620** is marked. Otherwise, the user may choose to click on cancel button **650** if the note is not to be saved.

When the e-book is connected to an internet enabled client, the present invention parses through all of the notes that have been saved, finds the notes tagged for sharing, and sends the notes to the indicated recipients, such as the book club selected from selection box **630** in **Figure 6**.

Figure 7 is a diagram of an electronic book with a pop-up window to sort notes in accordance with a preferred embodiment of the present invention. Pop-up window **700** may be displayed in response to a selection of sort note **530** in **Figure 5**. An e-book, such as e-book **470** in **Figure 4**, may be attached to an internet enabled client to receive new notes from other e-book users. For example, client **410** may send notes from e-book **420** to client **450** of **Figure 4**. When an option to sort notes, such as sort notes **530** in **Figure 5**, is selected a pop-up window sort notes **700** is displayed. Options, such as options **710**, **720**, **730**, and **740**, may be marked by a user to indicate the preferred sorting for the notes.

Selection of option **710** results in all notes, that have been received, being included in the e-book. Selection of option **720** result in only notes made by the user being included in the e-book. Option **730** may be selected to include the most popular notes in the e-book.

The ability to sort notes by author may be implemented by marking option **740** and using selection box **750** to allow the user to select the author of the note. This option allows for a user to select passages and notes for a particular user. The user may choose to click on save button **760** to receive the notes indicated by the marked option. For example, if the all notes option **710** is selected, all notes, that have been received, will be included in the e-book. Otherwise, the user may choose to click on cancel button **770** if the user wants to quit.

Figure 8 is a flowchart of the process of selecting recipients and groups of recipients for the highlighted

passages and/or notes in which the present invention may be implemented. Highlighted passages and notes refer to text in an e-book, which has be selected or notated for reference. The process illustrated in **Figure 8** may be implemented in a collaboration process, such as collaboration process **430** in **Figure 4**.

User input of a highlighted passage and/or note is received (step **820**). A list of recipients or groups of recipients may be displayed (step **830**). User input is received selecting a set of recipients (step **840**) to share the highlighted passage and/or note. A set of recipients may include one user, multiple users, groups of users, or multiple groups of users. The highlighted passage or note is sent to a set of recipients selected by user input (step **850**) with the process terminating thereafter.

Next, **Figure 9** shows a flowchart of the process of generating a note for collaboration in which the present invention may be implemented. A user has the ability to highlight passages within an e-book and to create a note associated with the passage. User input is received in which the user input highlights a passage for a note (step **910**). A determination is made as to whether the passage is already within an existing note (step **920**). If the passage is already included in an existing note, then that note is opened for append (step **930**). In other words, the note is opened so that additional text may be added to the note. Otherwise, a new note is opened for the highlighted passage (step **940**). User input editing the note is then received (step **950**). The process also proceeds to step **940** from step **930** if the note is opened for appending. The note is

tagged so that it may be sent for collaboration (step **960**) with the process terminating thereafter.

Figure 10 shows a flowchart of the process of highlighting passages for collaboration in which the present invention may be implemented. The process illustrated in **Figure 10** may be implemented in a collaboration process, such as collaboration process **430** in **Figure 4**.

User input is received of a passage being highlighted for collaboration (step **1010**). The passage is tagged so that it may be sent for collaboration (step **1020**) with the process terminating thereafter.

Next, **Figure 11** shows a flowchart of the process of sending highlighted passages and/or notes to a set of recipients in which the present invention may be implemented. The process illustrated in **Figure 11** may be implemented in a collaboration process, such as collaboration process **430** in **Figure 4**.

The highlighted passages or notes are automatically sent to a designated set of recipients through the use of the Internet as discussed in **Figure 1**. The process begins by detecting a connection to the Internet (step **1110**). A determination is made as to whether highlighted passages and/or notes are present to be sent (step **1120**). If there are any highlighted passages and/or notes to be sent, the highlighted passages are sent with the associated notes to the highlighted passage (step **1130**). The collaborated highlighted passages and/or notes from other users may be downloaded to the current user's e-book (step **1140**). The results are processed for

presentation in the current e-book (step **1150**) with the process terminating thereafter.

Figure 12 is a flowchart of the process of receiving highlighted passages and/or notes from other users in which the present invention may be implemented. The process illustrated in **Figure 12** may be implemented in a collaboration process, such as collaboration process **430** in **Figure 4**.

The recipients can receive or download the highlighted passages and/or notes, which were sent from other users, into their e-books. The process begins by determining whether highlighted passages or notes for the user exist (step **1210**). If highlighted passages and/or notes from other users exist for the e-book, the selection criteria are determined for downloading the highlighted text into the e-book (step **1220**). The passages and notes are sorted and grouped using a set of criteria (step **1230**) with the process terminating thereafter. Users of the present invention can specify criteria, which is used to group and sort the highlighted passages and/or notes For example, a user can choose to order the received highlighted text based on popularity with the most popular highlighted text listed first. Additionally, a user may choose to order the highlight text from a particular user first.

Figure 13 is a flowchart of the process to display highlighted passages or notes in which the present invention may be implemented. The process illustrated in **Figure 13** may be implemented in a collaboration process, such as collaboration process **430** in **Figure 4**.

The process begins by determining whether local notes are present (step **1310**). This step identifies which notes are notes on the current user's e-book. Local notes are notes created by a user on the e-book, while collaboration notes are notes received by the user from other users of the e-book.

If there are local notes present, the related passages to the notes are highlighted (step **1320**). These passages are the text within the e-book that have been marked as being associated with the note. Next, a determination is made as to whether collaboration notes are present (step **1330**). If collaborative notes are present, the related passages to those notes are highlighted (step **1340**). A determination is made as to whether passages are present in which the passages are to be highlighted (step **1350**). If there are passages present, these passages are highlighted (step **1360**) with the process terminating thereafter.

It is important to note that while the present invention has been described in the context of a fully functioning data processing system, those of ordinary skill in the art will appreciate that the processes of the present invention are capable of being distributed in the form of a computer readable medium of instructions and a variety of forms and that the present invention applies equally regardless of the particular type of signal bearing media actually used to carry out the distribution. Examples of computer readable media include recordable-type media such a floppy disc, a hard disk drive, a RAM, CD-ROMs, and transmission-type media such as digital and analog communications links.

The description of the present invention has been

presented for purposes of illustration and description, and is not intended to be exhaustive or limited to the invention in the form disclosed. Many modifications and variations will be apparent to those of ordinary skill in the art. For example, the illustrated examples are described with respect to an e-book. The mechanism of the present invention may be implemented for use with other electronic documents, including, for example, an email message, a word processing document, and an HTM page. Additionally, text forming passages may be highlighted in a number of ways in the depicted examples. A color may be used to graphically indicated the text, such as yellow to simulate highlighting of the text with a yellow marker. The text may be highlighted in other ways, by bolding the text, underlining the text, or italicizing the text. Also, a change in font type or size may be used to highlight text. The embodiment was chosen and described in order to best explain the principles of the invention, the practical application, and to enable others of ordinary skill in the art to understand the invention for various embodiments with various modifications as are suited to the particular use contemplated.